Hospital Authority Convention 2004 - Hong Kong SARS Forum

CDIS (Communicable Diseases Information System): Tools for the CHP
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The SARS outbreak in early 2003 has underlined the need to improve data connectivity between the Hospital Authority and the Department of Health. During the outbreak the need for information between the two organizations was divergent between that of clinical treatment and public health purposes. Despite the inability to access each other’s information stores at the start of the epidemic, through the facilitation by the Hong Kong Police’s MIDSS (Major Incident Investigation, Disaster Support System), this innovative interaction provided major support to the crisis management. As recommended by the SARS Expert Committee, an enhanced information management system across the relevant sectors, building on the success of e-SARS, MIDSS and CCIS, should be established for more effective communicable disease control on a permanent basis.

To this end a joint development has been initiated by the Department of Health and the Hospital Authority of CDIS (Communicable Disease Information System), a suite of tools for the future Centre of Health Protection. The aim of the development is to provide real-time integration of the Clinical Management System (CMS) within the HA, laboratories both private and public sectors and public health disease surveillance systems and to assist outbreak investigations and disease surveillance in the hospitals and the community. The CDIS will collect communicable disease related data from private and public healthcare sectors, ambulatory and hospital services and from other non-medical institutions. It will strengthen disease surveillance by incorporating state-of-the-art bio-statistical and mathematical analytic tools, decision support tools, geospatial and case-event clustering analysis tools to facilitate advanced epidemiological analysis and modelling and real-time alert for emerging infectious diseases. An internet based disease reporting portal facilitates data collection from all clinical sectors and will facilitate the dissemination of intelligence on communicable diseases to the medical professionals and the public.

SARS: Respiratory Manifestation and Clinical Course
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SARS is a highly infectious disease which typically presents with high fever, diarrhea and shortness of breath. Respiratory manifestation can range from very mild to significant respiratory failure. The first phase of SARS is a viral replicative phase (Peiris et al., 2003). More lung involvement occurs when the patient enters the second immune-pathological phase. More than one-third of all the SARS patients required high flow oxygen therapy, and 13-26% developed acute respiratory distress syndrome (ARDS). Chest radiographs show initial unilateral or bilateral lower to mid-zone peripheral ground-glass shadows, which progress upward to form focal, multifocal or diffuse consolidation. High-resolution computer tomography (HRCT) of the thorax is more sensitive in detecting lung involvement. Spontaneous subcutaneous emphysema, pneumothoraces and pneumomediastinum are distinct complications that may be potentially aggravated by noninvasive (Cheung et al., in press) or invasive ventilation. Lung histology in the early stage shows acute-phase diffuse alveolar damage (DAD), and that in later stage shows organizing-phase DAD with increased fibrosis and hyperplasia of type II pneumocyte. In the early phase, anti-viral agent(s) should be given. When patient enters the phase of immune-pathological damage, immunomodulatory agents like corticosteroids are usually administered. They may result in quicker resolution of fever, lung infiltrates and improvement in oxygen saturation (So et al., 2003). However, rebound phenomenon is sometimes seen after early improvement. If there is persistently deteriorating clinical condition and increasing lung infiltrates, high-dose pulsed corticosteroids can be considered for rescue (Lau et al., 2004). The last phase of pulmonary destruction occurs if excessive host response is uncontrolled. In patients who continue to improve, radiographic shadows usually persist for some time and may not warrant further corticosteroids. Patients on high dose corticosteroids and mechanical ventilation are particularly susceptible to superimposed bacterial and opportunistic infections, and such septic picture may not be easily distinguishable from SARS relapse. Older age is a consistent poor prognostic factor in all outcome series. With greater understanding of this disease, morbidity and mortality of SARS in future can hopefully be minimized.

References

Anti-Viral Therapy for SARS: Clinical Use
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Severe Acute Respiratory Syndrome (SARS) is caused by a novel coronavirus and it carries a considerable mortality. Clinical and pathological studies suggest that the pathogenesis is related to both viral proliferation and immunopathological damage (Peiris et al., 2003; Nicholls et al., 2003). High viral load at presentation is associated with subsequent need for intensive care (Ng et al., 2003). Effective anti-viral therapy may reduce intubation rate and mortality. In vitro antiviral susceptibility testing showed that the cytopathic effect of the prototype SARS coronavirus (HKU-39949 isolate) was inhibited by lopinavir at 4 mg/ml and ribavirin at 50 mg/ml after 48 hours of incubation and synergism was demonstrated with a low viral inoculum (Chu et al., 2004). In a study of 41 patients treated with lopinavir/ritonavir (LPV/r) and ribavirin before the patients developed acute respiratory distress syndrome (ARDS), the 21-day adverse clinical outcome (ARDS or death) was significantly
Corticosteroid in the Management of SARS
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The efficacy of corticosteroid administration in the management of Severe Acute Respiratory Syndrome (SARS) remains controversial. There was an abnormal immunopathological reaction at the early stage of SARS onset shown in the transbronchial lung biopsy, demonstrating shedding of alveolar epithelium, proliferation of fibroblast and myofibroblast and hyalinization of the alveolar wall. These abnormalities were not found in those with bacterial or clamydial pneumonia; 50% of patients with SARS who met the criteria of severe acute respiratory distress syndrome showed dramatic improvement after receiving bolus of methylprednisolone (500mg/d) in terms of oxygen index and chest radiography.

A comparison of corticosteroid administration on the survival rate of SARS patients was made in Guangzhou recently. Among 642 cases with diagnosed SARS (seroconversion on 4-fold rise in SARS coronavirus IgG titer, 358 cases met with the criteria of critical SARS: a) respiratory rate=>30/min, b) chest radiography deteriorated progressively (>50% within 48 hrs), c) persistent high fever (>39°C for more than 3 days). They were divided into two groups: steroid group (n=252) and supportive group (n=106). The average dose of methylprednisolone (MP) was 140±120mg/d for 17±7days. Median values of parameters (score of chest radiography, oxygen index, etc) were collected in three consecutive days before and on week two after MP administration. Having adjusted all main confounders, MP demonstrated beneficial effect on the survival of critical SARS patients (p=0.065 in the probability of death by logistic regression, p=0.036 in the Force of fatality by Cox regression).

More clinical studies are needed to further clarify the indication, available time and the dosage of corticosteroid in the management of SARS.

Non-invasive Ventilation in the Management of Patients with Critical SARS
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Non-invasive ventilation (NIV) is a standard mode of ventilatory assist in early acute respiratory failure and acute respiratory distress syndrome due to various causes. An open study in Guangzhou showed that NIV was indicated in those severe acute respiratory syndrome (SARS) patients who developed desaturation (Oxygen saturation in arterial blood, SaO2<90%) despite oxygen supplementation (3-5L/min), with persistent tachypnea (>30/min) and progressive deterioration on chest X-ray (>50% with 8hrs). Intubation was avoided in two-thirds of patients in this group, with the improvement of tachypnea (respiratory rate from 35.0±8.8/min to 29.3±9.6/min, p<0.05; SaO2 from 91±4.1 to 96.6±1.6/min).

Continuous positive airway pressure (CPAP) with 4-10cm H2O was preferred in the most SARS patients, due to the better compliance (nasal CPAP in particular) and less air leak. A preliminary comparison of intubation rate and crude fatality rate in SARS patients was conducted between Hong Kong (n=1755) and Guangzhou (n=528) (NIV: 2.0% vs 23.1%; intubation: 14.0% vs. 7.4%; fatality: 17.1% vs. 5.5%). Further comparison study of NIV between two cities is on the way to assess if NIV plays a role in reducing fatality of SARS.

No evidence was shown that NIV causes cross infection in medical staff.

Hidden Morbidity: Psychosocial Perspective
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Introduction
There is dearth of any systematic data about the psychiatric morbidities in Severe Acute Respiratory Syndrome (SARS) patients during the recovery stage.

Objectives
To determine the prevalence and risk factors of psychological morbidity in SARS patients at immediate post-discharge, 6 months and 1 year follow-up period. The early and accurate identification of those patients who are in need of psychosocial services can lead to a timely and appropriate implementation of psychological services.

Methodology
Two hundred and four SARS patients were interviewed by a team of psychiatrists with a Chinese version of Semi-Structured Clinical Interview for the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders. They were also administered a series of psychometric inventories. For the six months follow-up study, 124 ex-SARS patients completed both psychiatric interview and self-reported questionnaires.

Results
At the early post-discharge phase, over 40% of the SARS 204 patients had at least a diagnosable psychiatric disorder. A spectrum of psychiatric morbidities was encountered at the initial recovery stage of SARS. The commonest diagnosis was the organic mood disorder related to SARS illness and other psychiatric disorders.
Impact of SARS on Mortality and Use of Health Services in Hong Kong
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An outbreak of SARS occurred in Hong Kong during 2003. We aim at describing the possible impact of SARS on changes of the utilization pattern of health services, and on the mortality pattern during this period among the non-SARS cases.

We conducted a review of service statistics with special focus on changes during and after the SARS coronavirus (CoV) epidemic when compared with the corresponding months in previous years. Qualitative assessments were conducted for changes of admission practices during the outbreak. To account for the changes of utilization of services, we used indicator procedures to reflect patient attitude and practice. The severity of diseases presented at Accident & Emergency (A & E) Department was assessed by the triage categories to test the possibility of delay in seeking treatment. We also reviewed total deaths, and deaths by specialty and diagnosis to provide the mortality pattern to explain the impact of SARS on user behaviour.

An overall reduction of inpatient days (22%), outpatient services (ranging from 28% to 16%), outpatient admissions (50% to 34%), as well as A & E attendances (40% to 39%) and admissions (39% to 30%) during April to June 2003 was followed by a recovery over the rest of 2003 which could not reach the level of previous years.

Provider-induced factors included fees adjustment, redeployment of staff to high load areas during the SARS episodes, deferment of non-urgent services, early transfer of patients to convalescence hospitals, and isolation practices in the hospitals. Patient factors influencing use of services included a delay in seeking consultation from HA hospitals due to fear of transmission of the SARS CoV, and a diversion of use of services to the private sector.

Overall mortality statistics in Hong Kong for March to May 2003 showed an increase in deaths compared to that of previous years. Subtracting the deaths due to SARS, the other deaths were distributed equally among private and public hospitals. This increase in the number of deaths could be partly explained by the delay in seeking treatment and admission to hospitals. However, the reduction of the total deaths during June to July 2003 may mean an early capture of those with severe conditions in the preceding months because the total number of deaths for the whole year was not appreciably changed.

The SARS Experience: Lessons Learned by Private Healthcare Providers
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The SARS experience taught private healthcare providers how vulnerable they were in terms of infection control, isolation facilities, contingency plans and resources. They were fortunate to have unconditional backup by the Government through HA, which took in all suspected and confirmed cases from private hospitals. Inadequacies in private-public interface, exemplified by a lack of ready dialogue, were promptly exposed. A lot has been done to improve communication and education since, but there is need for both parties (sectors) to see each other as partners in healthcare.

Currently the volume of private hospital services has surpassed the pre-SARS era. Precautions against SARS and contingency plans still apply, and are generally familiar to staff. Problems remain, including unaffordable indemnity insurance and deficiency in proper isolation wards. Private hospitals must continue to depend on government support. Government, on the other hand, should involve the private sector in strategic planning, so that Hong Kong as a whole will be better prepared for future pandemics and disasters.